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AUTHOR Boland, Pat, Ed.
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ABSTRACT

This booklet looks at a specific part of the diversity of students in school-to-work (STW) programs--gender in a multicultural context--to help educators, private industry, parents, and policy makers incorporate equity into their STW programs. After a brief overview of STW, the booklet outlines the School-to-Work Opportunities Act, explains the importance of school-to-work initiatives, and describes how gender-biased messages influence girls' and boys' career choices. Equitable techniques are presented that support school-to-work programs through each of their three components: work-based learning, school-based learning, and connecting activities. The booklet concludes with three sections--strategies, student equity-related competencies, and an equity checklist--that offer suggestions from equity specialists for planning and implementing STW programs that meet the needs of students. Appendixes include the following: 26 endnotes, a list of 29 readings and resources, and the names and addresses of 12 resource organizations. (YLB)

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Equitable Outcomes

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Editing by Pat Boland
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School-to-Work
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Introduction

For the past decade, school reformers, educators, parents, students, business, and community have agreed that our schools must be fundamentally transformed. When we examine education reform from the perspective of "who benefits?" we link the role and purpose of our educational system to the kind of society we want. School-to-Work (STW) is one of the latest attempts to reform education. While an important aspect of STW is providing the knowledge, skills, and attitudes to help the nation and our students survive economically, that is not its only purpose.

STW initiatives also promote high standards, high expectations, and equity and fairness for students from a wide range of experiences. Placing the diversity of our students at the core of our planning helps us keep the purpose of education firmly in mind within STW, as well as in all of education reform. This booklet looks at a specific part of that diversity—gender in a multicultural context—in order to help educators, private industry, parents, and policymakers incorporate equity into their STW programs.

What Is School-to-Work?

In its broadest vision, STW creates partnerships between the educational system and the workplace. STW can create access to the traditional routes to academic and economic success for students who have previously been locked out. STW can introduce students to a wide range of future employment options, including but not limited to careers in technology. It can provide teachers and students with a better understanding of the demands and excitement of the workplace. And it can provide opportunities for more students to enter and succeed in higher education.

STW programs have the potential to respond to an important truth about how students learn. *Students learn in different ways.* Most students learn well from a combination of both reading, and experience, but for individual students, that combination may vary. Some learn better in more traditional classrooms where learning focuses on reading, writing, and conversation. But many other students learn better through experience. They learn by *doing*, whether it is applying chemistry in a neighborhood-based project, tutoring a younger student while studying about education, or performing hospital tasks that relate directly to mathematics and science. These experiences link students—whether they will go to college or directly to the workplace—to a broader sense of the workplace and highlight the relevance of their studies to their lives beyond high school. For many students, these hands-on work experiences give them their first glimpse of a range of career possibilities they never before imagined.

STW programs can offer not just cognitive understanding but a firsthand, concrete experience of the skills, tools, tasks, time lines, and pressures involved. The realities of a job often differ from the ideal perception of the job. In a real medical setting students rapidly lose the Hollywood concept of a doctor and begin to think in terms of bookkeeping and the logistics of running an office, or 4:00 A.M. emergency room duty.

Each STW program must include three components:

- *Work-based learning* that provides a planned program of job training or experiences, paid work experience, workplace mentoring, and instruction in general workplace competencies and a range of industry-specific elements
- *School-based learning* that provides career exploration and counseling, instruction in a career major, a program of study based on high academic and skill standards, at least one year of postsecondary education, and periodic evaluations of students' academic strengths and weaknesses
- *Connecting activities* that coordinate the involvement of employers, schools, and students, match students with work-based learning opportunities, and train teachers, mentors, and counselors

Partnerships

Whenever a school and business are in proximity—and that is almost everywhere—the potential for a partnership exists. Where businesspeople and school personnel have recognized the ways in which partnerships can be mutually beneficial, they are proliferating. The partnership programs vary greatly, as do their benefits. For example, a company may subsidize a concert series for a neighborhood school district to provide students with exposure to the fine arts. Another company might provide speakers to talk to various classes about their occupations and to act as role models for students. Career fairs, work-experience programs, seminars for teachers about the business world, and a sharing of facilities and equipment are only a few of the ways schools and businesses work together.

Women and the Economy

In the United States most women continue to work in low-wage, dead-end jobs. European American women with five years of postsecondary education earn 69 cents for every dollar earned by males with the same amount of education.[1] For African American women this ratio is only about 58 cents; for Hispanic/Latina women it is 54 cents.[2] Since only 4 percent of U.S. families today fit the old model of man working outside the home, woman working in the home, and two preschool children, the economic need for women to work is clear.[3] Women contribute significantly to the family income in two-parent households: In white families women contribute 34 percent of the family income, in African American families, 50 percent, and in Hispanic families, 40 percent. The number of female-headed households continues to rise, and their earning power is significantly less than that of two-parent households; 47 percent of white female-headed households and 72 percent of African American female-headed households live in poverty.[4]

In the ten years between 1995 and 2005 women will comprise almost half the work force, with women of color accounting for the greatest increase in number. Of the 54 million employed women in the United States, 75 percent work full time. Women, like men, work because they have to. Fifty-nine percent of married women are in the work force, bringing median family income for these households to $48,169, compared with $30,075 for families in which the wife has no paid employment. Single female heads of households, who are in the labor force in even greater numbers, earn a median family income of only $16,692.[5]

Despite the fact that more women are working and attaining higher-paying managerial and professional jobs, there are still many more women than men in low-paying jobs. The average weekly earnings of women who work full-time is only 75 cents for every dollar earned by men ($381 for women and $505 for men).[6]

The more education a woman has, the greater the chances she will look for work. And, both women and men with specialized technical training are likely to earn half a million dollars more in a lifetime than someone working at a low-skill, minimum wage job. With more families living in poverty—especially

families headed by women—we need to develop models of education and workplace support that offer opportunities to help women and their families become economically self-sufficient. Ignoring this need will push more and more women and their families into an endless cycle of poverty. STW holds the potential to change this.

Skill Standards

Closely linked to STW are academic standards for various grade levels in science, mathematics, English, and other subjects and national voluntary skill standards for a variety of industries. Both can help improve classroom and applied learning by providing a problem- and performance-based approach that requires teachers and students to apply rigorous academic knowledge to real situations. The very best standards will

- *engage stakeholders* from industry, education, and the community in the design and validation process—developing a common language and respect for the contributions of each sector
- *encourage restructuring of learning*—with a focus on student mastery of both technical and academic skills through problem solving
- *create a framework* for using alternative assessment tools, such as portfolios, products produced, oral reports, and research projects, to measure the new demands of high-performance workplaces
- *serve as a guide* for the professional development of workplace mentors, teachers, and workplace supervisors—all of whom will be engaged in helping learners succeed
- *promote flexibility* about where learning takes place—drawing on the very best mix of workplaces, community settings, and schools
- *hold everyone accountable* to a higher level of student achievement for all students—promoting effective teaching and learning strategies such as cooperative and team learning and appropriate use of new technologies
- *provide students with opportunities* to be engaged citizens in a variety of settings

The School-to-Work Opportunities Act

The School-to-Work Opportunities Act, Federal Public Law 103-329 (H.R. 2884), was signed into law in May 1994. Implications for gender equity are woven throughout the act, and opportunities abound for the development of comprehensive partnerships and curricula that address content, pedagogy, student assessment, and the infusion of equity and diversity considerations. For example, the intent of the act is "to increase opportunities for minorities, women, and individuals with disabilities, by enabling individuals to prepare for careers that are not traditional for their race, gender, or disability." "All students" are defined as both male and female students from a broad range of backgrounds and circumstances, and "career guidance and counseling" programs are to be those that develop career options "with attention to

surmounting gender, race, ethnic, disability, language, or socioeconomic impediments."[7]

The act allows programs to address local needs and respond to changes in the local economy and labor market. States and localities can build STW systems upon existing successful programs, such as youth apprenticeship, tech-prep education, cooperative education, career academies, and school-to-apprenticeship programs. The legislation also promotes the coordination of state, local, and other federal resources to enable the programs to continue when STW funds end. The act encourages the active and continued involvement of local business, education, union, and community leaders.

Equity and STW

Supporters of STW initiatives see them as a way to involve business and industry in redesigning education to meet the needs of the future; critics, however, worry that business and industry will define education in terms of their own employment requirements rather than a full range of students' economic, social, and civic needs. While many hold a vision of STW as a new concept in education reform, others describe it as a way to get "the forgotten half" into the work force. While some see STW as an opportunity to broaden access to higher education for many students of color and poor students, others view higher education solely in terms of community colleges and technical programs.

Those concerned with equity cannot afford to wait; it is critical that equity concerns become central to this national debate. We need to enter the debate and contribute the lessons we've learned in other equity arenas. We can become full partners in an effort to remove educational and economic barriers for women, people of color, and people with disabilities. Together we need to examine

- the ability of systems to recruit, retain, and bring success to female students, male students of color, students whose first language is not English, and students with disabilities
- whether STW channels students to high-wage, technology-related occupations, providing little or no access to other careers such as law, education, or the arts
- whether the focus on local job market needs may not adequately take into account the rapidly changing economy or the mobility of individuals within the United States
- how, as a new partnership between education and employment, STW programs can become a mutual partnership in which both education and employment are transformed, instead of being driven solely by the needs of business

If STW programs are for everyone, they need to pay particular attention to the needs of individuals within specific groups—those who are female, are of

color, have disabilities, speak a language other than English, or are teen parents. We are at a crucial point in the development of STW, a point where we can draw together the best learning and experience from education, equity, community, and the workplace. As we bring this expertise together, we can develop a new model—disaggregating the data, evaluating our efforts, and refining the work in progress. A rigorous look at how the program works for all students—for each student—provides the opportunity to build a stronger model.

Vocational Education

Because STW is grounded in successful career preparation and apprenticeship programs, there may still linger a misconception that it is a vocational education program or that it is not for all students. We therefore run the risk of falling into old assumptions or stereotypes that will work against the full participation of all students. If a program is perceived as one for "the forgotten half" it will become another tracking system despite the best of intentions. STW needs to build an inclusive infrastructure for human development and productivity. The benefits of a fully functioning STW system can be recognized as benefits for all students.

Students with Disabilities

The School-to-Work Opportunities Act, the Americans with Disabilities Act, and other legislation all require students with disabilities to be included in education. For STW, this opens up a new set of questions about creating the least restrictive environment and providing the necessary transportation, support services, and inclusion.

Given their off-site work experiences, STW programs need to pay particular attention to each student's specific learning style and level of ability to ensure the best match. For instance, students who have attention, behavior, or motivational problems may learn better in a controlled environment in which behavior management techniques can be instituted.

While openness to students with disabilities helps teachers and the workplace staff recognize that students with disabilities are useful members of society, this recognition needs to be accompanied by changes in instructional strategies. Staff in STW programs need to adapt instruction to the students' backgrounds and ability levels and to pay attention to the attitudes and behaviors of the other students or workers on site. Any effective STW program will include training on disabilities for both educators and worksite staff.

Female students with disabilities face hurdles both because of their gender and because of their disabilities. Young women with disabilities do not receive either the quality or quantity of vocational education that male students with disabilities receive. Vocational training for females falls mainly in the low-paying service sectors, such as food service and office work, whereas that for males falls mainly in skilled professions, like construction.

Students of Color

As people living in a multiracial society, we need to examine the cultural messages we receive about the wide variety of cultural and ethnic groups that make up the United States. Hidden, subtle, and all too often negative messages and stereotypes are omnipresent. These messages may seem legitimate because they come from recognized and institutionalized sources such as television, film, books, and schools.

Being American Indian, Asian American, African American, or Hispanic within U.S. culture is often vastly different from the experience of being white. Racism, segregation, and stereotyping can negatively influence a student's achievement in school, or participation in a STW program, especially when staff, agencies, or administrators lack sensitivity to these factors and their influence on the participants.

STW staff must become familiar with the issues that affect student attitudes and behavior. Some of these issues affect communication between staff and students and can create obstacles to a student's ability to learn and achieve. An awareness of, and sensitivity to, differences in values, attitudes, and approaches to problems will help improve cross-cultural communication. It is important to address these differences by acknowledging them and sharing concerns rather than by placing the onus for being different on the student.

Students Who Speak English as a Second Language

STW programs need to pay attention both to the language needs of students who speak English as a second language and to their cultural assumptions and experiences. Effective recruitment, counseling, site placements, and support programs will often include materials in the student's native language as well as English, and give particular attention to increasing the student's proficiency in English while continuing to value their primary language. It is often through their primary language that students who speak English as a second language gain their first and deepest understanding of concepts they will later want to express in English.

Teen Parents

As an important target population in STW, teen parents have specific needs that STW must address directly if these students are to be served effectively. Their needs include child care and transportation, housing, and a strong support system. Teen parents may not be able to participate in STW programs because they live below the poverty level, have not completed high school, and/or lack a comprehensive academic plan.

Links between STW and Gender Equity

The term *gender equity* describes an environment in which girls and boys, women and men are given the tools to make choices based on their abilities and talents, not on the basis of stereotypes and biased expectations. Such an environment brings about freedom from favoritism based on gender. The achievement of gender equity enables women and men of all races, ethnic backgrounds, and abilities to develop skills needed in the home and in the paid work force, skills that are best suited to an individual's needs, informed interests, and abilities. It opens economic, social, and political opportunities for all people. It fosters mutual trust because persons of both sexes are unrestricted in their roles. The promotion of gender equity in vocational education involves creating an educational environment that allows students to *choose* from the gamut of vocational programs and careers, to *enter* those programs, to *participate* in them fully, and to *benefit* from them—all without regard to gender. This concept needs to be expanded to nonvocational classrooms and work-based learning programs.

Gender Stereotyping and Career Expectations

Much of the early work in vocational education and nontraditional education addressed deeply held stereotypes about appropriate careers for males and females. Hundreds of programs around the country, supported by affirmative action and Title IX, pushed for the inclusion of women and girls in nontraditional careers. These careers—in the skilled trades, crafts, engineering, and construction—were opportunities for high-wage, flexible careers.

> It is rare for women to be actively excluded from vocational and technical programs or from the jobs themselves. Instead the status quo in recruitment, hiring, and job retention operates unintentionally to discourage women from considering these nontraditional careers.*

Similar concerns have surfaced about the participation of females in mathematics- and science-related careers. Mathematics and science are often the key to future economic and social well-being, opening the doors for careers in technology and many other high-wage professions. Unlike other nontraditional subjects, the need for advanced mathematics is now often an accepted reality for girls, their teachers, their parents, and future employers. Girls are taking more math and science classes in high school and are earning more degrees in related fields; but women are still not choosing mathematics and science careers. STW can help to correct this situation by building on the

existing models for gender equity that have been developed in both nontraditional occupation (NTO) and math/science programs.

> If a woman ever wants to consider the option of self-reliance and true personal independence, she has to acquire practical abilities. Personally, the most tangible effect of my learning to work on cars, other than making more money, has been the confidence I have gained about doing tasks that would usually only be assigned to men, things like fixing a toaster, replacing a stove pipe, etc. There's a lot of freedom in that.[9]

Nontraditional career programs and math/science initiatives for girls also have lessons to share with STW about the impact of gender-role stereotyping. Gender-role stereotypes on the part of students, teachers and counselors, parents, employers, and work colleagues have long played a role in determining whether students see a career as open and inviting or as unattainable and hostile.

Expectations that certain careers—such as construction, mathematics, or bioscience—are "for boys" whereas other careers—such as teaching, nursing, or administrative support—are "for girls" are often unconscious or unspoken. However, they continue to shape the teaching and counseling methodologies of schools, guide parents to push boys into mathematics and science, and shape a workplace culture that does not support women in their dual roles as workers and parents.

This dual role most women play is often unrecognized by employers, colleagues, teachers, and counselors. But it is often a major consideration on the part of women and girls as they make career choices. Despite significant participation in the workplace, women are still expected to be the primary nurturers within the family.

> I think women need to consider nontraditional occupations if they are ever to have any real political power. High-level decisions are made these days on the basis of technical advice, whether about energy projects or production levels in industry. You can't take a whole group that is ignorant of technology and expect them to have much power or influence on these vital questions.[10]

The expectation that this "women's work" should not affect work continues to guide the structure in the workplace as well. Women must often choose between jobs that pay less but offer the flexibility to be home with children after school (since few affordable day-care options exist) and jobs with better pay that require significant involvement, but risk penalties. In addition, the lesson of custody hearings in which ex-husbands sought (and gained) custody of their children by claiming that the mother was working too much has not been lost on women and girls.

These messages continue to tell women that the workplace and society frown on their full participation. Until we begin to change the expectations not just of female students but also of their male counterparts, teachers, counselors,

and employers, no program will change the economic reality for most women. The workplace must also change to reflect the changing needs of workers and become both supportive of women and "family friendly."

Equity Guidelines for STW

The key to understanding the implications of gender equity and equity for all students within STW is to build a dialogue within the STW community incorporating the rich expertise and experience of work in nontraditional occupations, math and science for girls, and other equity programs. As states and communities begin planning and implementation, equity specialists can raise a series of key questions to help infuse equity into the process, such as the following:

- How can we help ensure that all students in the programs are *provided with options leading to productive and rewarding futures?* What does it mean to say that STW is for all young people? Is it designed to help all students? How does STW use career exploration for all students? How do we ensure that STW explores professional careers, offers career ladders, and broadens the concept of work for all?
- *How do we ensure equal access to STW?* What do student demographics tell us about who is recruited, and to which programs? What is the retention and success of individuals in a specific grouping—European American males/females, African American females/males, Hispanic males/females, students with disabilities, and so on? Who is going on to community college, technical college, or university?
- *How are programs conducted?* Is the program structured on the basis of proportional representation of all groups found within the school community? If not, how can this be corrected? Does it offer a career ladder option and a college option? How are students supported in the program? Does it include training on the "right to know" law? Does it have policies and procedures regarding sexual and racial harassment in both school-based and work-based components? How are workplaces supported and monitored to encourage equity? What adjustments need to be made to involve students with disabilities? How are the needs of students whose first language is other than English addressed? How does the STW program reach out to and include the active participation of parents?

Implementing Gender-Equitable STW

> Our counselor said that besides needing to learn traditional book things, we need to learn things about ourselves.... We will be learning what our own interests are, what we like and dislike, what we value and how they might tie into our future work, career, and lifestyle. I had no idea that high school was going to help me look at myself as a person.[11]

All students benefit from school and work learning environments flexible enough to accommodate their individual needs. Young women in particular need attention to develop high self-esteem and improve their academic achievement. The following teaching and learning strategies can enhance learning for all students, especially girls:

- Individualized and self-paced instruction based on students' strengths and weaknesses
- Short-term attainable goals
- Team-teaching (including community and business people)
- Educational technology: computer-assisted instruction, video, long-distance learning
- Frequent academic assessment, testing, and intervention
- Peer teaching, tutoring, counseling, and support
- Access to resource labs and centers
- Matching teaching to learning styles

Work-Based Learning

Work-based learning, one of STW's three major components, provides fertile ground for ensuring an equitable STW experience for all. However, traditional models of learning in workplaces such as cooperative education, workstudy, or internships are sometimes relabeled STW programs without the level of critical review STW requires (for example, developing a seamless system for grades K–14, or linking efforts to the community or economic development). These programs need to be reexamined and held to criteria that define equitable programs. Such criteria might involve the following questions:

- Is the work-based learning experience based on industry skill standards agreed upon or adopted by local firms and made public in advance to all students?
- Does the work-based learning experience expose students to a variety of departments, processes, and areas, including all aspects of the industry and allowing for a range of career choices?

- Are students encouraged to focus on specific skills as they experience U.S. workplaces firsthand?
- Are students monitored and evaluated by workplace supervisors for what they have learned in the workplace?
- Is there a clear connection between what is learned in the workplace and what is learned at school?
- Are students informed and supported in relation to their rights as workers (on harassment, for example)?
- Are students required to develop a research activity to extend their learning beyond the "hands on" skill development? This sort of requirement would give students a better understanding of how the industry functions and how each department or component impacts others in the work process.
- Are coworkers prepared to help students "learn" in the workplace?

Models of Work-Based Learning

Project SMART in Cleveland, Ohio, is a youth apprenticeship program that combines school- and work-based learning to help students make the transition from school to work. The Shadowing Program is one of many steps designed to accomplish this goal. The eleventh-grade intensive shadowing program, based on locally developed industry standards for manufacturing, is designed to introduce each student to the manufacturing process and several related departments. Learning does not focus on any one machine, operation, or job but rather provides some in-depth training in each of six different departments. Students come away from their work-based learning experience having had opportunities to practice industry skills and knowing more about the production process and all the departments that support it, as well as what areas they might choose to specialize in after this experience.

In Operation Breakthrough! teachers, administrators, employers, trade unions, parents, students, and the school board in Beaumont, Texas, come together to increase dramatically the number of young people who are prepared to enter technical occupations or further their education in math- and science-related fields. Operation Breakthrough! is guided by several expectations. Employers and workers expect teachers to learn about the nature of work by learning about workers, finding out about their concern for quality, gathering information about employability skills, careers, and understanding a few basic principles of workplaces. Employers also expect teachers to transfer what they learn at the worksite into a meaningful classroom experience for students and to provide employers with follow-up information.

Teachers in turn expect employers to help them in this learning process by sharing information about the company and about workers, showing them images of the workplace and examples of how learning there is integrated and used, and helping them learn about industry training and how employers use assessment. Teachers also expect to apply what they have learned with students, sharing their insights into what is going on in industry, conveying business and industry perspectives, and conducting follow-up activities.

Mentoring

Mentoring programs for students are generally designed with the goal of helping them develop either strong academic or vocational skills and contacts. Mentoring experiences for faculty are more often designed to help educators adjust more easily to a new position—as in the case of pairing new teachers or administrators with more experienced colleagues—or to help them gain the skills and contacts to move up and out of their current jobs.

Students who have mentors are more likely to be offered full-time jobs if they apply for them. This possibility counters the tendency for students to be satisfied with part-time work or to be channeled into work unrelated to their career interests. For women in underrepresented occupations, mentors can combat the isolation and fragmentation they experience by strengthening their bonds of friendship and networking.

Cross-Gender Mentoring

Should the mentoring process differ for people in the same organization, depending on their race or gender? Mentors of the same ethnicity as their protégés can often offer added benefits, especially for students of color. Other research suggests that cross-gender and cross-ethnic mentoring partnerships add other benefits. For instance, when the mentor is a white male and the protégé is not, the protégé may have an opportunity to learn more about those who currently run educational institutions.[12]

Some research suggests that men and women are inclined to assume stereotypical roles toward one another in work settings.[13] These roles are defined by assumptions and expectations concerning appropriate behavior for each sex. To reduce the uncertainty, ambiguity, and anxiety created by the emergence of cross-gender work relationships, men and women rely on what is familiar. In doing so, they sometimes unknowingly assume traditional roles they learned from past situations, roles that tend to constrain behavior and reduce individual competence and effectiveness.

People perpetuate stereotypical roles because these are what they know and are most comfortable with. In developmental relationships like mentoring, the challenge is to devise strategies for behavior that permit men and women to interact in a variety of appropriate ways within a given work context. In cross-gender developmental relationships, although women face dilemmas similar to those of their male counterparts, they also encounter others unique to being female in male-dominated organizations.[14]

For instance, concerns about the appropriateness of a particular behavior may appear unwarranted to a male mentor who does not understand that what works for a man may not work for a woman. (The same might be said about relationships across race and ethnicity.) Concerns about balancing work and family commitments are exacerbated for a woman who is simultaneously advancing her career and assuming the roles of wife and/or mother. These unique gender-related concerns may make it difficult for male mentors to empathize, to provide role modeling, and to identify with their female protégés in regard to these issues.[15]

School-Based Learning

Research such as the 1994 book *Failing at Fairness: How America's Schools Cheat Girls* by Myra Sadker and David Sadker and reports by the American Association of University Women (AAUW), have pointed to new directions for the academic achievement of women.[16] As in all education, specific gender equity issues need to be addressed in STW.

Technology

Because developing familiarity and facility with computers is an important educational goal for *all* students, schools need to ensure equity in computer access, use, and outcomes. Given that the presence of computers in our schools and workplaces is almost certain to increase, we need to understand why inequities in computer use exist and to develop effective strategies that will ensure equal opportunities and equitable outcomes for all students in their interactions with computers.

Gender differences have been documented in both use of and access to computers; girls are more likely to use computers for word processing, whereas boys are more apt to do programming. Boys have significantly more positive attitudes than girls toward computers, finding them more "enjoyable," "special," "important," and "friendly."[17]

A computer gender gap usually starts becoming noticeable at the middle school level and widens as girls get older.[18] Gender differences are more evident in advanced classes than in introductory courses.[19] Girls tend to be less confident than boys in their use of computers, and both boys and girls perceive computers as predominantly in the domain of males. These attitudes contribute to lower female enrollments in computer courses and in varying levels of interest.

Computers are versatile tools, suitable for activities ranging from music to mathematics—including design, problem solving, writing, and planning. Because many students develop their impressions about computers in schools, it is important for the computer tasks and the software available to meet the learning needs of all students and show how the technology can solve problems, aid in decision making, and achieve goals that students consider important and relevant. Computers are not inherently biased, yet in the contexts they are used they can often take on characteristics that reinforce gender bias.[20]

One method to illustrate the computer's usefulness in problem solving and its relevance to many activities and subjects is for teachers to develop specific computer design or research projects for their students. Another teaching strategy that appears to engage females in the use of computers is structuring collaborative learning experiences. This finding is consistent with evidence that it is not only what software is used in classrooms but how it is used that impacts student involvement with computers. There is some indication that collaboration may be a preferred work context for girls.[21]

Friends and peers also play a role in students' interactions with computers. Especially in adolescence, girls are sensitive to how they appear to others. They

should be particularly supported and encouraged in their use of computers, for example through a girls' computer club or class period. Role models can counterbalance the perceptions and images that imply that math, science, and technology are not relevant to girls' lives.

Positive parental attitudes can influence the attitudes of children toward computers. There is evidence to suggest that parents tend to encourage and support boys' learning in mathematics more than they do girls'; and there is some initial evidence that the same holds true with regard to computers.[22] Parents need to encourage both daughters and sons in the use of computers and to ask their children what they are doing specifically with computers in schools.

Mathematics and Sciences

Much of STW focuses on emerging technology. Gender stereotypes in math, science, and technology can create barriers that leave girls out of the process:

- Mathematics and science are masculine endeavors.
- Mathematics and science abilities are based on innate talents.
- White women and some people of color are less capable in mathematics and science.
- Most jobs require little math or science knowledge.
- White women and people of color are not suited to scientific careers.

Too many white women and people of color have low self-confidence and low expectations for success in math and science. A self-fulfilling prophecy of underachievement by girls and people of color in mathematics and science may be operating, reflecting the lower expectations of parents and teachers. White women and people of color often have different learning styles from white males, but in spite of these differences, most classrooms still embrace the traditional techniques preferred by males. Women and people of color receive less attention and different kinds of attention from classroom teachers. These inequities are more pronounced in mathematics and science classes and thus have major implications for recruiting and retaining females in the emerging high-technology fields.

Science is taught as a fixed body of facts, principles, and definitions to be memorized. Science is divided into the separate disciplines, thus fragmenting students' knowledge and understanding. Schools lack the equipment, resources, and trained teachers to sustain quality hands-on science and mathematics experiences. Science and math textbooks may be out of date, and they may continue to use content, examples, and pictures that are stereotypically masculine. The links to the workplace and its use of mathematics and science are important; these links may serve to push for improved school programs and resources.

Guidance counselors steer white women and people of color away from mathematics and science coursework and careers. Parents adversely affect their daughters' view of math and science and, consequently, their career aspirations. White women and people of color lack real models and cannot see the relevance of mathematics and science to their lives.

Compared with adolescent males, adolescent females are much less aware of what occupations are open to them, and they also have lower expectations for their probability of succeeding in them.[23] One of the ten policy recommendations in a report by the National Center for Research in Vocational Education is that "school counselors must . . . '[lean] over backward' to avoid being influenced by stereotypes that pervade the entire culture when they offer educational and labor market advice to young women of all racial and ethnic backgrounds.[24]

*Career Guidance**

Career planning is a critical filter for future employment, and STW can benefit from what is known about when and how to begin planning a career. Larwood and Gutek[25] have identified five elements to consider in the development of any model of career planning for women:

- Career preparation
- Timing and age
- Opportunities available
- Marriage
- Pregnancy and child rearing

Women enter the career exploration phase at a variety of stages in their lives, and there is more variation in female patterns of career development than in those of their male counterparts. An appropriate model of career planning for women should take into account the differential effects of gender on choices and decision making as well as on patterns of career development. Expectations of the adult female role, including the "homemaker option," influence each young woman's decision-making process, and consequently, her choice of career.

Existing career paths may be shaped by unrealistic expectations that ignore the biological time limitations for childbearing. The responsibilities of the dual role of worker and mother affect the career development and upward mobility of women who choose to have families.

Current research on women's career development maintains that there are significant differences between men and women in this area. This research identifies four major distinctions:

- Role expectations differentially affect the choices of jobs for males and females.
- Husbands and wives do not equitably accommodate themselves to each other's careers; usually the man's job assumes primary importance.
- Parenting is not equitably shared by men and women; the role of mother requires more time and effort than the role of father.

*Adapted from *Roles in Conflict: Women Preparing for Higher-Wage Technical Careers*, by S. McGarraugh, edited by M. Waterson, New York State Occupational Education Equity Center, Latham, N.Y.: 1990. Used with permission.

- Women face more barriers in the workplace, including stereotyped expectations, discrimination, and harassment.

Career Strategies

Counselors can help females develop realistic career planning strategies by addressing the elements described above. Simply selecting and preparing for a career is not adequate planning for the dual roles that most women will take on. Females need to examine a more complex array of factors when making career decisions.

Consider the following strategies to incorporate women's individual needs:

- Develop an approach that substitutes individualized time lines for the more traditional "stages" models of career development. Each woman, regardless of age, is encouraged to develop a time line for her career goals, complete with resources and schedules. Young women who plan to have a family should consider career interruptions, flexible scheduling options, and the timing of their reentry.
- Direct women to evaluate potential careers in terms of their particular lifestyle goals as well as their interests and abilities. Examine salary, benefits, additional training or educational opportunities, overtime, and travel; consider their impact on the current or anticipated lifestyle. Look for data that reveal the numbers and patterns of representation of women in the field.
- Provide appropriate role models who can speak to girls about the real opportunities for women in the field. Look for women whose age and ethnic background match that of your students. Structure individual and group sessions with the role models in a way that facilitates sharing both personal and professional experiences.
- Prepare women who select a male-intensive career for possible isolation, harassment, or other difficulties that may result from their minority status. Help these women identify the elements of risk taking in their choices and utilize activities and programs that prepare women for the challenge of pioneer status. Review the laws that protect women from sexual harassment and discrimination in educational institutions and in the workplace. Make available resources to help them develop preventive strategies or provide remedies for potential incidents.
- Identify various legitimate paths to a particular career goal. Emphasize the development of career ladders from an entry-level position to a more skilled or more responsible position. Encourage women to seek out employers who offer on-the-job training and tuition assistance programs for further education.

Increasingly, employers are placing value not on inputs, such as time spent in school, but on outcome-based criteria—demonstrated mastery of knowledge, skills, and behaviors required to do the job. New workers who meet these outcome-based criteria will not only be more likely to be hired for beginning-level jobs but will also be more prepared to work efficiently and to interact with

their coworkers. Their solid grounding in the fundamentals of the industry will also better qualify them to acquire the additional skills and knowledge needed to advance to higher-level positions.[26]

Connecting Activities

No STW initiative can be successful without the full participation of all segments of the larger community. Each segment needs to be aware of gender equity, its relationship to the various segments, and the way in which they can become an integral part of everyone's work.

Family and Community Participation

Families and communities can be made to feel welcome through a concerted outreach effort. Ways to work with family and community include the following:

- Educate the community about the realities, priorities, and problems facing education and the changing nature of education in a global society.
- Work to improve communities' present perception of teachers and schools.
- Increase collaboration among government, industry, community, and schools.
- Increase the participation of families.
- Seek the active involvement and commitment of those families not currently involved in the schools and include them in the educational reform process.
- Use volunteers in the schools (parents, retired teachers, senior citizens).
- Increase the participation of business and community organizations in mathematics, science, and technology education.
- Develop more internships and apprenticeships for students and teachers in business, industrial, and medical settings related to scientific and technical fields.
- Expand science, mathematics, and technology summer camp programs for white women and people of color.
- Develop school-business partnerships to enhance corporate mentoring programs and other collaborative efforts in math, science, and technology.
- Bring scientists, engineers, technicians, and community experts with diversity training into the classroom to bridge the gap between education and actual applications.
- Develop closer working relationships between schools and community and professional organizations that offer out-of-school, extracurricular programs in math and science (for example, Girl Scouts).

Teacher Professional Development

In a time of education reform, teachers need to be prepared to assume leadership for these reforms. Teacher professional development is critical to this endeavor and is especially important as we link school- and work-based

learning. One model for combining the exciting reality of the workplace with teacher professional development is the Industry Volunteers in the Classroom. In this model, classroom teachers leave their students for specific professional development activities throughout the year while industry volunteers replace them on a regular basis. Because industry volunteers have been most effective and comfortable when assigned to classrooms in pairs, such a project needs twice the number of volunteers as the number of classroom teachers involved.

Industry volunteers are encouraged to look for ways of making specific connections between their work and the classroom material and to design original lessons that build on those connections. They sometimes teach material specified by the classroom teacher as well. An industry volunteer model sets up a global partnership among local industries, schools, and educational support groups as well as a classroom partnership between two industry volunteers and a classroom teacher.

The experience industry volunteers share with students can lead to improved education and a better work force in the twenty-first century. When industry volunteers talk to students about their work, bring in demonstrations, or base lessons on their work experience, they make a significant impression on the students. While teachers can and do relate the importance of their subject knowledge to the work world, having industry volunteers bring their work into the classroom lends new meaning to the schoolwork.

Industry volunteers in classrooms not only offer students tangible evidence of the relevance of their school subject matter in future work, but can also provide role models of women and people of color in successful careers. They are also examples for students that there are interested adults who care about their progress.

Participating schools benefit from renewed, professionally stimulated teachers whose enthusiasm affects both their classes and their colleagues. The volunteers for their part gain increased awareness of the problems facing schools and an appreciation of the complexity of teaching. Such increased sensitivity helps make these volunteers informed, vocal advocates for education in their communities and workplaces.

Equity Resources

All of us—educators, equity specialists, and employers—need to rely on one another's expertise to ask the right questions and make STW partnerships really work. The following sections—Strategies, Student Equity-Related Competencies, and an Equity Checklist—offer suggestions from equity specialists for planning and implementing STW programs that meet the needs of students.

Strategies

The following strategies were suggested by Mary Wiberg, gender equity coordinator for vocational education in Iowa.

- Involve classroom teachers (academic and vocational education) in the development of STW programs.
- Involve businesses owned by women and people of color in the planning process.
- Involve community-based organizations that have worked with teen parents, gender equity programs, Girl Scouts, and others to understand how best to attract girls and to meet their needs.
- Train everyone—academic and vocational education teachers, counselors, administrators, employers, labor—in the intent of STW including the gender equity provisions.
- Involve elementary schools as well as middle schools to begin the process early—reaching parents and students in ways that help them value STW and nontraditional careers for students, before they are locked in to preconceptions.
- Hold special events for specific audiences—expand the idea of Non-Traditional Occupations (NTO) career fairs, provide role models, examine outreach, and target specific messages to girls, students with disabilities, the academically talented, and so on.
- Identify and provide the child care, transportation, or other support services that girls, especially teen parents, might need in order for them to be in STW.
- Encourage states to invite representatives from commissions on the status of women or other human rights and advocacy groups to participate in the planning.
- Identify resources that can assist in the training and technical assistance support for white women, people of color, people whose first language is not English, and persons with disabilities.

- Encourage states to establish a subcommittee on career guidance and counseling with membership that includes elementary, secondary, and postsecondary guidance staff and persons knowledgeable about NTO strategies that can be integrated into state plans.

Equity-Related Competencies

Student Equity-Related Competencies for Economic Self-Sufficiency and Equal Employment Opportunity are critical for the success of young women and men in today's world. These competencies are integral to program improvement initiatives in vocational education and are similar to the youth employment competencies established by private industry councils (PICs) for Job Training Partnership Act (JTPA) programs.

Barbara Bitters of the Wisconsin Department of Public Instruction developed a set of competencies for use in vocational education that can be applied to STW. Review the following equity-related competencies and consider which of them might be included in your STW programs.

General

1. Students will define and identify strategies to overcome role stereotyping, bias, and discrimination on the basis of race, gender, and disability.
2. Students will be able to define and give examples of "dual discrimination."
3. Students will identify and analyze societal attitudes about men and women, gender-role stereotypes and bias, and forms of gender discrimination.
4. Students will be able to recognize and neutralize role stereotyping and bias in educational materials.
5. Students will demonstrate the use of gender-neutral, inclusive language.
6. Students will develop a more positive attitude about the abilities of both genders, all racial and ethnic groups, and people with disabilities.

Work and Family

1. Students will identify the responsibilities associated with dual work roles—paid work and home and family work.
2. Both male and female students will identify changes in family structure and responsibilities and the need to develop complex, family-related skills.

Labor Force Facts

1. Students will demonstrate knowledge of historical changes in the labor force participation of males and females.
2. Students will identify historical barriers to equal employment opportunity.
3. Students will demonstrate knowledge that both men and women work for pay, in great numbers, for a long time and out of economic necessity.
4. Students will identify how role stereotyping, bias, and discrimination have contributed to occupational segregation in the U.S. labor market.
5. Students will demonstrate knowledge of how traditional women's work has been undervalued and underpaid.

Nontraditional Occupations

1. Students will be able to define "nontraditional occupations" and will identify positive and negative aspects of employment in nontraditional careers.
2. Students will identify nontraditional jobs for females and males and the skills needed on those jobs.
3. Students will identify some of the issues that arise when women/men work in nontraditional jobs.
4. Students will identify coping strategies to survive and thrive in nontraditional jobs.

Career Development

1. Students will identify how gender-role stereotyping and bias may limit opportunity in planning their own future.
2. Male and female students will demonstrate awareness of the total range of career and occupational choices.
3. Students will develop career development plans based on informed choice, labor market information, assessment of interests and skills, occupational exploration, and work experience rather than on factors related to stereotyping on the basis of gender, race, or disability.
4. Both male and female students will identify how emerging technology is influencing jobs of the future.
5. Both male and female students will demonstrate experience in how to prepare for, adapt to, and influence change in the labor force.
6. Students will identify reasons why both males and females must acquire math, science, and computer skills.
7. Students will identify how gender stereotyping, bias, and discrimination may affect career planning, occupation exploration and preparation, employability and job seeking, job retention and advancement, job benefits and professional development, earnings, financial planning and management, and entrepreneurship.
8. Students will identify and discuss employment skills that both males and females will need to survive and thrive in the future economy, including participative management skills, oral and written communication skills, assertiveness skills, teamwork skills, networking skills, cooperation skills, negotiation skills, flexibility skills, adapting skills, human relations skills, interpersonal skills, leadership skills, re-careering skills, coping skills for frequent and rapid change, and technological literacy skills.

Equity Checklist

This equity checklist is excerpted from *Equity Benchmarks for Vermont*, a 1994 publication developed by Joy Wallace, an equity specialist at the Vermont Institute for Science, Math, and Technology.

Curriculum and Climate

_____ Every student, at every grade level, uses manipulatives, calculators, and computers in mathematics lessons.

_____ Every student, at every grade level, uses science apparatus in science lessons.

_____ My school library has books about the contributions of African Americans, American Indians, Hispanics, and Asian Americans in all subjects.

_____ My school library has books about contributions to all subjects by people with disabilities.

_____ My school library continually updates materials and seeks to replace biased, stereotyped resources.

_____ I see evidence in my school of students treating each other with respect.

_____ I see evidence in my school of teachers treating every student with respect as an individual.

_____ Science and math classes are not tracked.

_____ Textbooks, library books, and other curriculum materials are all reviewed to ensure they are inclusive, represent diversity, and encourage students to participate in learning.

_____ My school seeks to update curriculum materials to ensure they are inclusive, represent diversity, and encourage students to participate in learning.

_____ Courses are scheduled in ways that encourage student participation, (that is, scheduling conflicts do not limit enrollment in courses).

Assessment

_____ Teachers use a variety of assessment strategies.

_____ Teachers use assessment strategies that are sensitive to diverse student populations.

_____ Assessment tools used in my school are unbiased for girls, limited English-speaking students, limited income students, and so on.

_____ Standardized test scores for students at my school show no differences based on gender, income level, disability, race, or ethnicity.

_____ If standardized test scores *do* show differences, my school is demonstrating increases in the rate of achievement for under-represented groups.

Professional Development

_____ My school offers professional development opportunities for teachers that focus on equity issues.

_____ Teachers and administrators in my school attend equity-related professional development opportunities.

Management and Governance

_____ My district has a policy supporting increased equity for students.

_____ My district has a plan that translates our equity policies into action.

_____ Equity policies and plans have been disseminated to all school board members.

_____ Equity policies and plans have been disseminated to all parents.

_____ Equity policies and plans have been disseminated to all teachers.

_____ My school has a policy statement about how equity relates to curriculum, teaching, and learning.

_____ All data collected by my district/school are analyzed by gender, race, ethnicity, disability, and income.

Community Outreach

_____ A review of sample outreach materials shows that they are inclusive (welcoming all family groupings, translated into languages other than English when appropriate) and free of stereotyping.

_____ Programs such as Family Math and Family Science are offered to parents.

_____ My school sponsors at least one activity per year designed to increase awareness of the need to recognize and address inequities.

_____ All materials developed by my school use inclusive language (that is, do not exclude single parents, do not use generic "he," and so on).

_____ All materials developed by my school use inclusive graphics.

_____ All data collected by my district/school are reported out to the public on a yearly basis analyzed by gender, race, ethnicity, disability, and income.

Access to Technology

_____ Computers are used by all students in science and math.

_____ Telecommunications supports learning in my school.

_____ All students have keyboarding skills.

_____ All teachers have access to telecommunications in my school.

_____ Every student can use word processing to write an essay.

_____ Every teacher can use word processing to write an essay.

_____ The principal and superintendent use telecommunications to link with the Department of Education and others.

Notes

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[18] J. S. Sanders, "Computer Equity for Girls," in *Sex Equity in Education: Readings and Strategies*, ed. by A. O'Brien Carelli (Springfield, Ill.: Charles C Thomas, 1988).
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Organizations

American Vocational Association
1410 King Street
Alexandria, VA 22314
800-826-9972

Center for Education, Employment, and Community
Education Development Center, Inc.
55 Chapel Street
Newton, MA 02158-1060
617-969-7100

Coalition of Labor Union Women
1126 16th Street, NW
Washington, DC 20036
202-296-1200

ERIC Clearinghouse on Adult, Career, and Vocational Education
Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090
614-292-4353 or 800-848-4815

ERIC Clearinghouse on Counseling and Student Services
University of North Carolina at Greensboro
School of Education
Greensboro, NC 27412-5001
919-334-4114 or 800-414-9769

The National Center for Research in Vocational Education
2150 Shattuck Avenue
Suite 1250
Berkeley, CA 94720-1674
510-642-4004

National Committee of Pay Equity
1126 Sixteenth Street, NW
Room 411
Washington, DC 20036
202-331-7343

Office of Vocational and Adult Education
U.S. Department of Education
600 Independence Avenue, SW
Room 4518
Washington, DC 20202-7242
202-260-9576

Opportunities Industrialization Centers of America
3224 16th Street, NW
Washington, DC 20010
202-265-2626

School-to-Work Opportunities Office
400 Virginia Avenue, SW
Room C-100
Washington, DC 20024
202-401-6222

Skill Standards Team Office
U.S. Department of Labor
200 Constitution Avenue, NW
Room S637
Washington, DC 20210
202-208-7018

Women's Bureau (national office)
U.S. Department of Labor
200 Constitution Avenue, NW
Room S3002
Washington, DC 20210
202-219-6667

Educational Equity List

EDEQUITY (Educational Equity Discussion List) is an international Internet discussion list focusing on theory and practice of equity in education in a multicultural context. To subscribe, send the message *subscribe edequity* to MAJORDOMO@CONFER.EDC.ORG
(Do not use a "subject" line.)

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School-to-Work Network

STWNet is an international Internet discussion forum on school to work transition, the U.S. Youth Fair Chance initiative, and all other school-to-work related issues. To subscribe, send the message *subscribe stwnet* to MAJORDOMO@CONFER.EDC.ORG
(Do not use a "subject" line.)

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School-to-Work: Equitable Outcomes

A school-to-work program's ability to help *all* students succeed is crucial. The program must serve the needs of students who are female, are of color, have disabilities, whose first language is not English, or are teen parents. *School-to-Work: Equitable Outcomes*, outlines the School-to-Work Opportunities Act, explains the importance of school-to-work initiatives, describes how gender-biased messages influence girls' and boys' career choices, and teaches equitable techniques that support school-to-work programs.

"*. . . a wonderful resource for effective school reform planning. . . . Professionally describes the implications of gender equity and equity for all students within the School-to-Work Act. I highly recommend* [School-to-Work: Equitable Outcomes] *to anyone interested in infusing equity into the school-to-work process.*"

—Ed T. Little, Chair, National Coalition for Sex Equity in Education

"*A comprehensive overview of the need to integrate equity into STW efforts. . . .* [School-to-Work: Equitable Outcomes] *draws on existing programs and strategies that can enhance a STW program.*"

—Craig P. Flood, The Equity Center, Latham, New York

"*The Equity in Education Series is filled with pertinent information that is sure to assist classroom teachers, administrators, and the general community in understanding the issues surrounding equity in the classroom.*"

—James P. Heiden, Gender Equity Cadre Chair
Cooperative Educational Service Agency #1, Wisconsin

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